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EXAMINER

FORMAN, BETTY J

ART UNIT

PAPER NUMBER

1634

DATE MAILED: 04/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/003,458

**Applicant(s)**

CHEN ET AL.

**Examiner**

BJ Forman

**Art Unit**

1634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 06/02.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Priority***

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Taiwan on 13 April 2001. It is noted, however, that applicant has not filed a certified copy of the foreign application as required by 35 U.S.C. 119(b).

***Claim Objections***

2. Claim 6 is objected to because the claim contains two periods “.”.  
Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
  - a. Claims 1-18 are indefinite in Claim 1, line 5 for the recitation “the light” because the recitation lacks proper antecedent basis in the claim. It is suggested that Claim 1 be amended to provide proper antecedent basis e.g. delete “the”.

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b. Claims 1-18 are indefinite in Claim 1, line 6 for the recitation "the status" because the recitation lacks proper antecedent basis in the claim. It is suggested that Claim 1 be amended to provide proper antecedent basis e.g. delete "the".

c. Claims 1-18 are indefinite in Claim 1, line 7 for the recitations "the variations" and "the light" because the recitations lack proper antecedent basis in the claim. It is suggested that Claim 1 be amended to provide proper antecedent basis e.g. delete "the".

d. Claim 5 is indefinite for the recitations "LED", "LD", and "UV" because the recitations are abbreviations the meaning of which may change over time. It is suggested that Claim 5 be amended to replace the abbreviations with the complete term or phrase.

e. Claims 6-7 are indefinite in Claim 6 for the recitation "each carrier being coated with biological reagents thereon and surrounded by an opaque cladding" because it is unclear whether the carrier or the biological reagents are "surrounded by" the cladding. It is suggested that Claim 6 be amended to clarify.

f. Claim 7 is indefinite for the recitation "by gathering plural of plastic fibers..." because the syntax is confusing. It is suggested that the claim be amended to clarify e.g. replace "plural" with "a plurality".

g. Claims 8, 10-11 are indefinite in Claim 8, line 3 for the recitation "converted the light being received as an electronic signal" because "light being received" lacks proper antecedent basis in Claim 1 and because the syntax is confusing. It is suggested that Claim 8 be amended correct the syntax and to provide proper antecedent basis e.g. replace "converted" with "converts", delete "the" and replace "as" with "into".

h. Claim 9 is indefinite for the recitation "the one selecting" because the recitation lacks proper antecedent basis in Claim 1. It is suggested that Claim 9 be amended to provide proper antecedent basis e.g. delete "the".

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i. Claim 9 is indefinite for the recitations "CMOS", "CCD", and "PMT" because the recitations are abbreviations the meaning of which may change over time. It is suggested that Claim 9 be amended to replace the abbreviations with the complete term or phrase.

j. Claim 10 is indefinite for the recitations "IEEE", "PC" and "USB" because the recitations are abbreviations the meaning of which may change over time. It is suggested that Claim 10 be amended to replace the abbreviations with the complete term or phrase.

k. Claim 11 is indefinite for the recitation "PC" because the recitation is an abbreviation the meaning of which may change over time. It is suggested that Claim 11 be amended to replace the abbreviation with the complete term or phrase.

l. Claim 11 is indefinite for the recitation "or smartphone, in wireless" because it is unclear whether "wireless" modifies the "smartphone". It is suggested that Claim 11 be amended to clarify.

m. Claim 13 is indefinite for the recitation "the light receiver is arranged in a single one or in a matrix" because it is unclear whether the recitation is intended to limit the light receiver to a single receiver or in the alternative a plurality of light receivers. It is suggested that Claim 13 be amended to clarify e.g. replace the recitation with "the light receiver is a single receiver or arranged in a matrix".

n. Claim 13 is indefinite for the recitations "the variation" and "the light source" because the recitations lack proper antecedent basis in Claim 1. It is suggested that Claim 13 be amended to provide proper antecedent basis e.g. delete "the".

o. Claim 13 is indefinite for the recitation "so as to sensor the variation of light" because "sensor" is a noun and not a verb which is required in the context of the claim. It is suggested that Claim 13 be amended to provide proper syntax e.g. replace "sensor" with "read" (see specification, page 10, lines 10-12).

p. Claim 14 is indefinite for the recitation “the variation” because the recitation lacks proper antecedent basis in Claim 1. It is suggested that Claim 13 be amended to provide proper antecedent basis e.g. delete “the”.

q. Claim 14 is indefinite for the recitation “by the light receiver on the recording medium” because it is unclear whether “on the recording medium” modifies the receiver. It is suggested that Claim 14 be amended to clarify.

r. Claim 14 is indefinite for the recitation “the variation sensed” because “sensed” is not a verb and as such the syntax is confusing. It is suggested that Claim 14 be amended to provide proper syntax e.g. replace “sensed” with “read” (see specification, page 10, lines 10-12).

s. Claim 17 is indefinite for the recitation “in other electronic devices” because the recitation lacks proper antecedent basis in claim 16 which does not recite an electronic device. As such it is unclear to what “other electronic devices” are being claimed.

t. Claim 18 is indefinite for the recitation “is made all-in-one including display” because it is unclear whether the recitation is intended to limit the process by which the PDPA is “made” or whether the recitation is intended to describe an integrated device comprising all of the components into a single device. It is suggested that Claim 18 be amended to clarify.

u. Claim 18 is indefinite for the recitation “including display” because the recitation lacks proper antecedent basis in Claims 1 and 16 which do not recite “display”. It is suggested that Claim 18 be amended to provide proper antecedent basis.

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5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-5, 8-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vo-Dinh et al (U.S. Patent No. 6,197,503, issued 6 March 2001) in view of Hammock et al (U.S. Patent No. 6,395,562, filed 4 September 1998).

Regarding Claim 1, Vo-Dinh et al teach a biochip testing system comprising a light transmitter, a biochip having a plurality of cells each coated with a biological reagent, a support for carrying the biochip and a light receiver for receiving light from the transmitter acting with the reagent on the chip whereby status of each cell of the chip may be tested through variations of light passing the biochip (Column 2, line 61-Column 3, line 22). Vo-Dinh et al do not teach the support for carrying the biochip is a recording medium. However, recording medium supports were well known in the art at the time the claimed invention was made as taught by Hammock et al. who teach that recording medium supports are particularly useful for reagent detection because the supports contain both the components of reagent reactions and information on the reaction (Column 2, lines 27-37) and thereby increases assay automation and efficiency while reducing cost (Column 2, lines 6-12). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the recording medium support of Hammock et al to the support of Vo-Dinh et al to thereby contain both reagents and reagent information as taught by Hammock et al (Column 2, lines 27-37) for the expected benefits of increased assay automation and efficiency and reduced cost as taught by Hammock et al (Column 2, lines 6-12).

Regarding Claim 2, Vo-Dinh et al teach the system wherein the biochip is transparent e.g. glass (Column 7, lines 11-14).

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Regarding Claim 3, Vo-Dinh et al teach the system wherein the biochip is transparent e.g. nitrocellulose (Column 7, lines 11-14).

Regarding Claim 4, Vo-Dinh et al teach the system wherein the light transmitter includes a light source (Column 3, lines 2-6).

Regarding Claim 5, Vo-Dinh et al teach the system wherein the light source is e.g. LED (light emitting diode) (Column 12, lines 6-18).

Regarding Claim 8, Vo-Dinh et al teach the system wherein the light receiver includes a photoelectric converter and a signal processing unit wherein the converter converts light received as an electronic signal and the signal processing unit converts the electronic signal through current/voltage transform and analogue/digital transform into a digital signal which is displayed on a monitor (Column 2, line 61-Column 3, line 22 and Column 13, lines 6-50).

Regarding Claim 9, Vo-Dinh et al teach the system wherein the light receiver is selected from the group consisting of CMOS, photodiode array and photodiode (Column 9, line 1-Column 10, line 50).

Regarding Claim 10, Vo-Dinh et al teach the system wherein the electric signal may be displayed on electronic devices e.g. personal computer (Column 13, lines 6-50).

Regarding Claim 11, Vo-Dinh et al teach the system wherein the electric signal may be displayed on electronic devices e.g. personal computer (Column 13, lines 6-50).

Regarding Claim 12, Vo-Dinh et al teach the system wherein the biochip is detachably adhered on the support i.e. the probes are immobilized on a membrane which is attached to a membrane in contact with the support (Column 7, lines 40-49).

Regarding Claim 13, Vo-Dinh et al teach the system wherein the light receiver is a single receiver or arranged as a matrix of receivers (i.e. photodiode array) so as to read the variation in light reflected from or passing through the biochip (Column 9, line 1-Column 10, line 50).



Regarding Claims 14-15, Vo-Dinh et al do not teach the receiver further comprises a writing head for writing on the recording medium. However, Hammock et al teach a similar biochip comprising a recording medium wherein the light receiver comprises a writing head for writing information received onto the recording medium (Column 3, line 65-Column 4, line 20 and Claim 3) wherein the recording medium is an optical disc (Column 3, lines 44-55 and Column 8, lines 23-25). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the information writing head of Hammock et al to the system of Vo-Dinh et al and to write information read by the receiver onto the support to thereby provide the support with both reagents and information relating to reagent reactions. One of ordinary skill would have been motivated add a writing head to the system of Vo-Dinh et al based on the teaching that supports containing both the components of reagent reactions and information on the reaction (Column 2, lines 27-37) increases assay automation and efficiency while reducing cost (Column 2, lines 6-12).

Regarding Claim 16, Vo-Dinh et al and Hammock et al teach the biochip testing system of Claim 1. Specifically, Vo-Dinh et al teach the biochip testing system comprising a light transmitter, a biochip having a plurality of cells each coated with a biological reagent, a support for carrying the biochip and a light receiver for receiving light from the transmitter acting with the reagent on the chip whereby status of each cell of the chip maybe be tested through variations of light passing the biochip (Column 2, line 61-Column 3, line 22) and Hammock et al teach a similar biochip wherein the support is a recording medium support (Column 2, lines 27-37). As such, Vo-Dinh et al and Hammock et al personal digital biochip assistant of Claim 16.

The claim is drawn to a "personal digital biochip". However, the courts have stated that a preamble is generally not accorded any patentable weight where it merely recites the intended use, and where the body of the claim does not depend on the preamble for completeness but, instead, the structural limitations are able to stand alone (see *In re Hirao*,

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535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d at 152, 88 USPQ at 481).

In the instant case, the preamble is not accorded any patentable weight because it merely recites the intended use for the biochip testing system (i.e. personal use) and because the components of the system, are able to stand alone and are capable of performing the intended use.

Regarding Claim 17, Vo-Dinh et al teach the system wherein the results are presented in other electronic devices e.g. personal computer (Column 13, lines 5-50).

Regarding Claim 18, Vo-Dinh et al teach the system wherein the system is integrated into a single device (Example 1, Column 14, lines 1-26).

7. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vo-Dinh et al (U.S. Patent No. 6,197,503, issued 6 March 2001) and Hammock et al (U.S. Patent No. 6,395,562, filed 4 September 1998) as applied to Claim 1 above and further in view of Krull et al (WO 98/58079, published 23 December 1998).

Regarding Claims 6-7, Vo-Dinh et al teach a biochip testing system comprising a light transmitter, a biochip having a plurality of cells each coated with a biological reagent, a support for carrying the biochip and a light receiver for receiving light from the transmitter acting with the reagent on the chip whereby status of each cell of the chip maybe be tested through variations of light passing the biochip (Column 2, line 61-Column 3, line 22). Vo-Dinh et al do not teach the support for carrying the biochip is a recording medium. However, recording medium supports were well known in the art at the time the claimed invention was made as taught by Hammock et al. who teach that recording medium supports are particularly

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useful for reagent detection because the supports contain both the components of reagent reactions and information on the reaction (Column 2, lines 27-37) and thereby increases assay automation and efficiency while reducing cost (Column 2, lines 6-12). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the recording medium support of Hammock et al to the support of Vo-Dinh et al to thereby contain both reagents and reagent information as taught by Hammock et al (Column 2, lines 27-37) for the expected benefits of increased assay automation and efficiency and reduced cost as taught by Hammock et al (Column 2, lines 6-12).

Vo-Dinh et al teach the system wherein the support is a polymer material such as glass or nylon wherein one end of the support is coated with biological reagents (Column 7, lines 6-23) but they do not teach the support is an optical fiber comprising a plurality of plastic, glass or quartz fibers and surrounded by cladding. However, optical fiber supports comprising a plurality of plastic, glass or quartz fibers and surrounded by cladding were well known in the art at the time the claimed invention was made as taught by Krull et al .

Krull et al teach a system similar to that of Vo-Dinh et al comprising a light transmitter, a biochip having a plurality of cells each coated with a biological reagent, a support for carrying the biochip and a light receiver for receiving light from the transmitter acting with the reagent on the chip whereby status of each cell of the chip maybe be tested through variations of light passing the biochip (page 10, lines 9-23 and page 11, lines 19-31) wherein the support is an optical fiber comprising a plurality of glass fibers surrounded by cladding (Abstract and page 43, lines 1-8) wherein the optical fiber conveys emitted light by total internal reflection to the detector thereby optimizing sensitivity and detection (page 11, lines 1-27). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the optical fiber biochip of Krull et al to the biochip system of VO-Dinh et al to thereby convey emitted light by total internal reflection to the

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detector thereby optimizing sensitivity and detection as taught by Krull et al (page 11, lines 1-27).

### Conclusion

8. No claim is allowed.
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (703) 306-5878. The examiner can normally be reached on 6:30 TO 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones can be reached on (703) 308-1152. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 308-8724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.



BJ Forman, Ph.D.  
Patent Examiner  
Art Unit: 1634  
April 22, 2003